AMENDMENTS TO THE CLAIMS

IN THE CLAIMS:

Claims 1-50 (CANCELED)

51. (Currently Amended) A method for conducting a hybridization assay within an enclosed hybridization chamber, comprising:

(a) providing a device comprised of a (i) a substrate having a surface with at least a portion of said surface representing a hybridization region, wherein a plurality of oligonucleotide probes are bound to the substrate surface within the hybridization region and arranged in a spatially defined and physically addressable manner, and (ii) a cover which sealingly contacts the substrate surface about the hybridization region, wherein the cover and the hybridization region form an enclosure having an interior space comprising a hybridization chamber having a height less than about 0.5 mm; and

(b) introducing into the hybridization chamber a sample fluid comprising (i) a target molecule which may hybridize to a surface-bound molecular probe within the hybridization region, (ii) a hybridization buffer, and (iii) a surfactant of a type and present at a concentration effective to substantially reduce nonspecific binding and promote mixing of components within the sample fluid; and

(c) mixing the sample fluid by moving a bubble within the hybridization chamber to displace the sample fluid and maintaining hybridization conditions within the hybridization chamber for a period of time sufficient to allow hybridization between the target molecule and a surface-bound molecular probe to occur.

52. (Original) The method of claim 51, wherein the hybridization chamber has a volume in the range of about 0.2 μl to about 312 μl.

53. (Original) The method of claim 52, wherein the hybridization chamber has a volume in the range of about 1 μl to about 200 μl.

54. (Original) The method of claim 52, wherein the hybridization region has an area in the range of about 4 mm^2 to about 500 mm^2.

55. (Original) The method of claim 53, wherein the hybridization region has an area in the range of about 20 mm^2 to about 350 mm^2.

56. (Previously Presented) The method of claim 51, wherein the surfactant additionally comprises a surfactant selected from the group consisting of anionic surfactants, cationic surfactants, amphoteric surfactants, nonionic surfactants and combinations thereof.

57. (Previously Presented) The method of claim 56, wherein the surfactant is an anionic surfactant.

58. (Original) The method of claim 57, wherein the anionic surfactant is a sodium, potassium, ammonium or lithium salt of lauryl sulfate.

59. (Original) The method of claim 58, wherein the anionic surfactant is lithium lauryl sulfate.

60. (Original) The method of claim 56, wherein the surfactant is a nonionic surfactant.

61. (Original) The method of claim 60, wherein the nonionic surfactant is polymeric.

62. (Original) The method of claim 61, wherein the nonionic surfactant is polyethylene oxide.

63. (Original) The method of claim 51, wherein the surfactant represents in the range of approximately 0.1 wt. % to 10 wt. % of the sample fluid.

64. (Original) The method of claim 63, wherein the surfactant represents in the range of approximately 0.5 wt. % to 5 wt. % of the sample fluid.

65. (Original) The method of claim 64, wherein the surfactant represents in the range of approximately 0.75 wt. % to 5 wt. % of the sample fluid.

66. (Original) The method of claim 51, wherein the surfactant comprises a combination of polyethylene oxide and lithium lauryl sulfate, and further wherein the polyethylene oxide represents up to about 1 wt. % of the sample fluid and the lithium lauryl sulfate represents up to about 0.5 wt. %

of the sample fluid.

67. (Original) The method of claim 51, wherein an air bubble is present within the hybridization chamber.

Claim 68 (Canceled)

Claim 69-71 (Canceled)

72. (Previously Presented) A method according to claim 51 wherein the surface is a silane functionalized surface.

73. (Previously Presented) A method according to claim 56 wherein the surface is a silane functionalized surface.

74. (Previously Presented) A method according to claim 58 wherein the surface is a silane functionalized surface.

75. (Previously Presented) A method comprising:

(a) sealingly contacting a cover to a first substrate having a plurality of molecular probes bound to the surface of the first substrate to form a first sealed hybridization chamber <u>having a height less than about 0.5 mm</u> about the substrate surface-bound molecular probes,

(b) performing a hybridization assay with the first sealed hybridization chamber and a sample comprising a target molecule which may hybridize to a surface-bound molecular probe,

(c) opening the hybridization chamber and removing the first substrate,

(d) reusing the cover by sealingly contacting the cover to a second substrate having a plurality of molecular probes bound to the surface of the second substrate, wherein the cover and substrate surface form a second sealed hybridization chamber about the substrate surface-bound molecular probes,

(e) performing a hybridization assay with the second sealed hybridization chamber and a sample comprising a target molecule which may hybridize to a surface-bound molecular probe.

76. (Previously Presented) The method of Claim 75, further comprising compressing together at least

one of: the first substrate and cover and the second substrate and cover.

77. (Previously Presented) The method of claim 76, wherein said compressing is accomplished by tightening screws.

78. (Previously Presented) The method of Claim 51, wherein said cover comprises a peripheral lip.